FIG_1

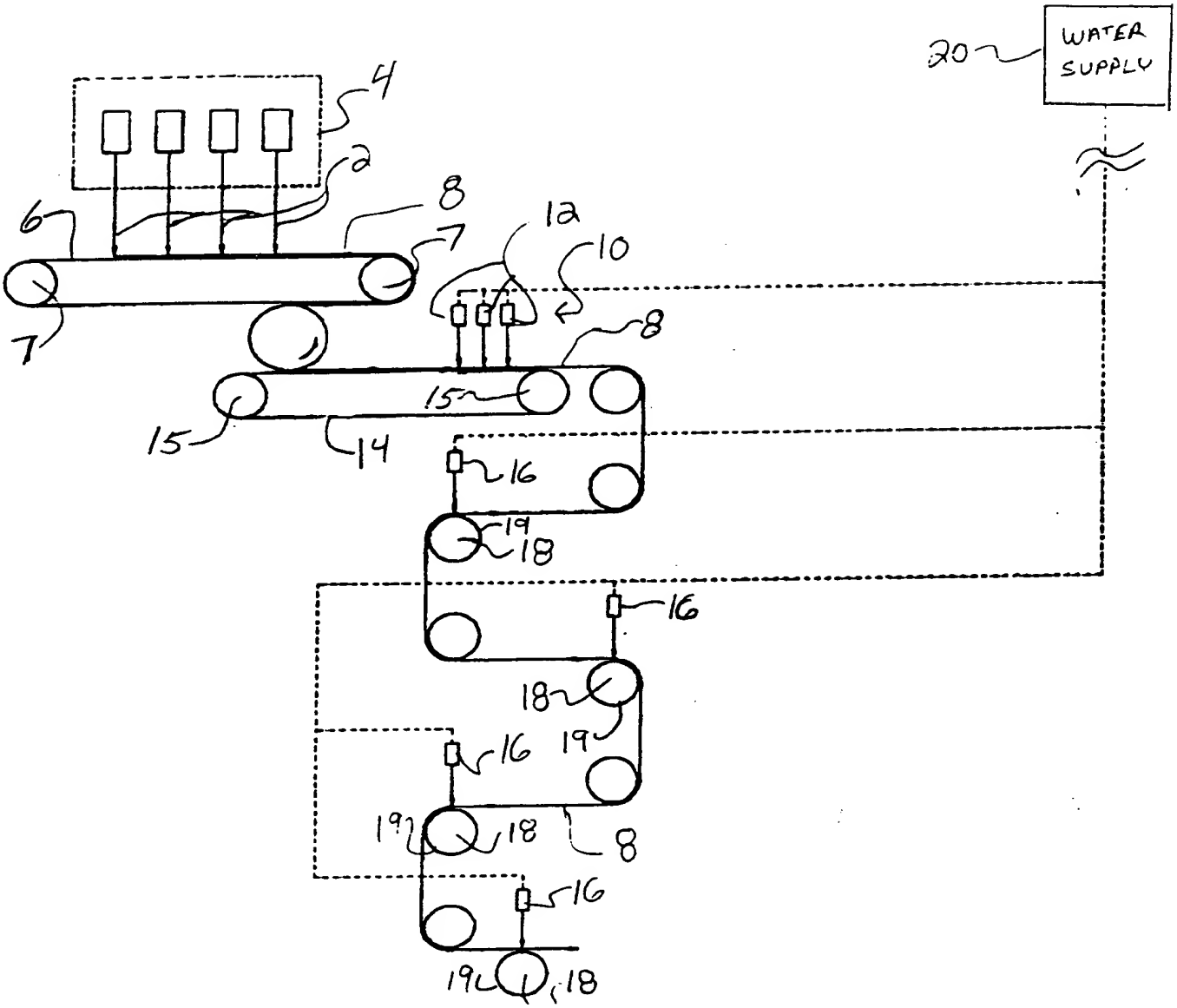


FIG_2

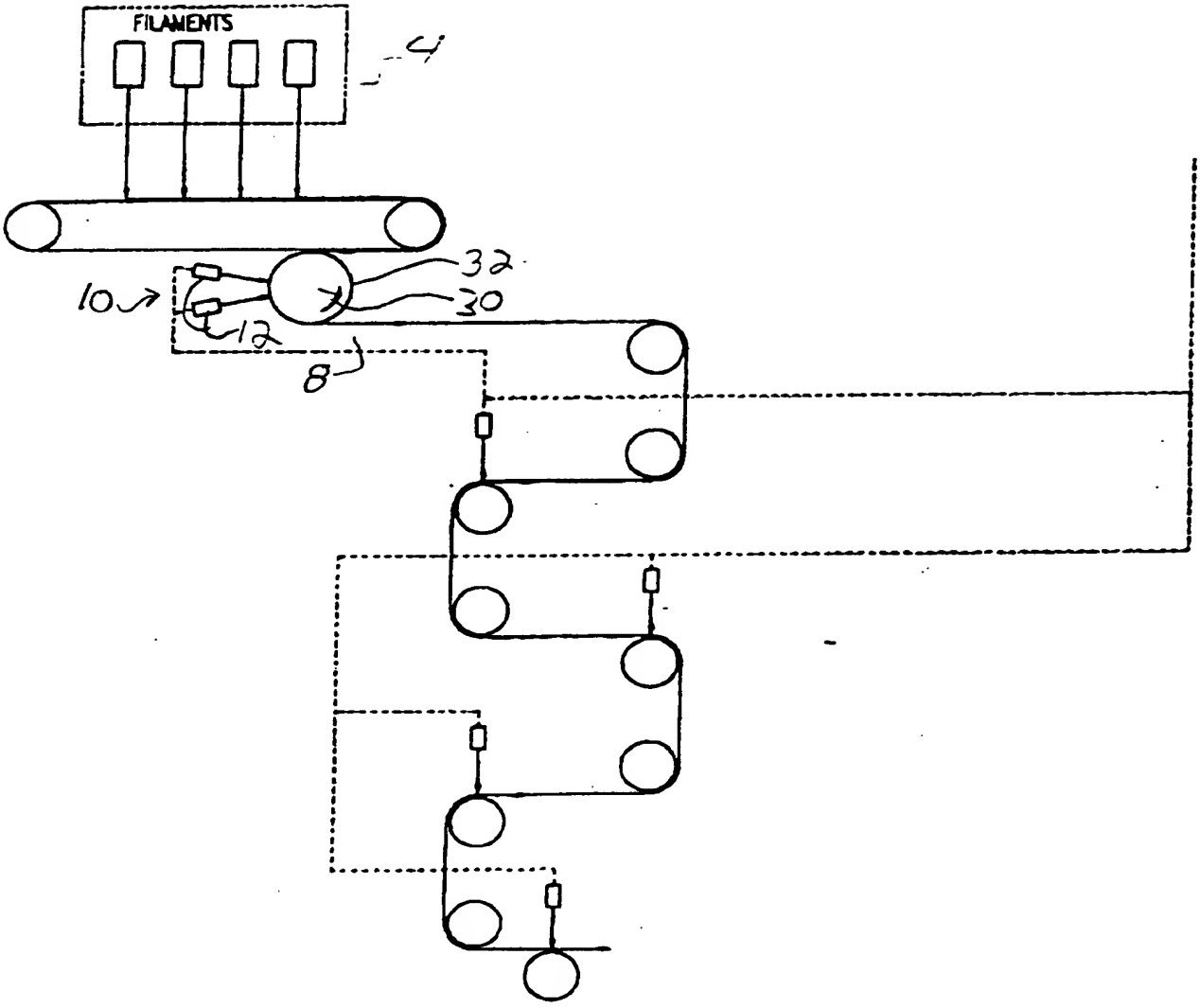


FIG_3A

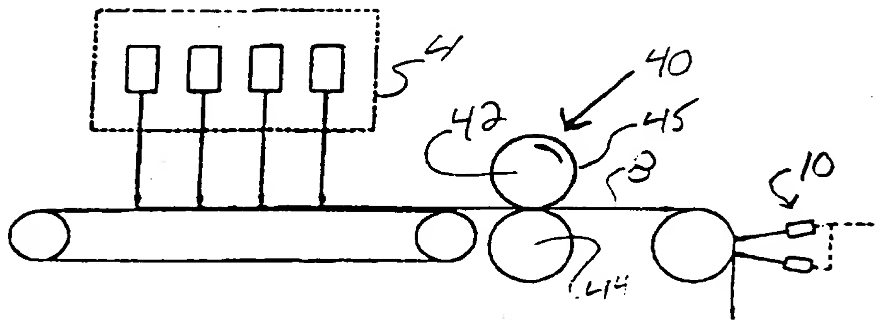


FIG_3B

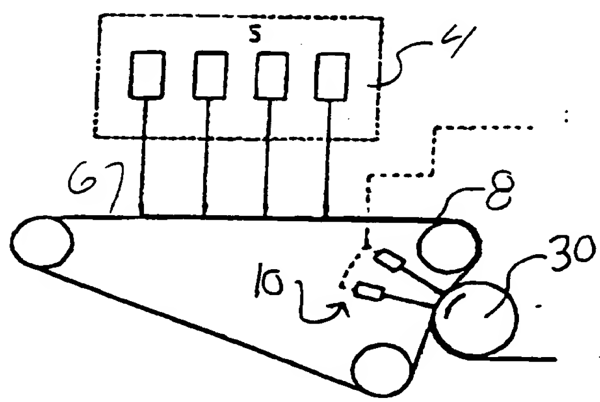


FIG_3C

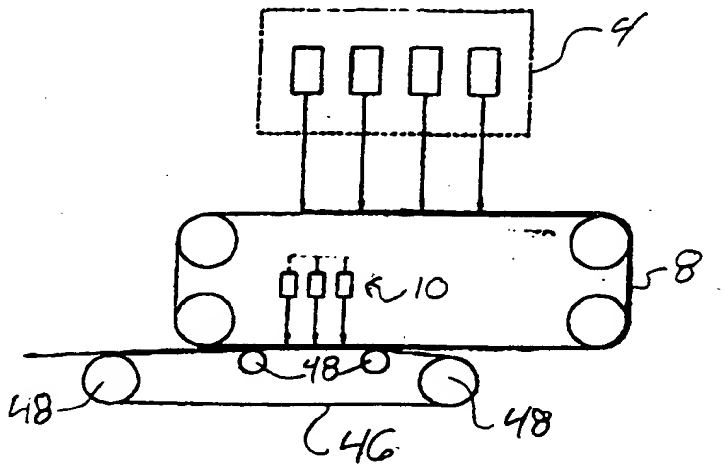


FIG_3D

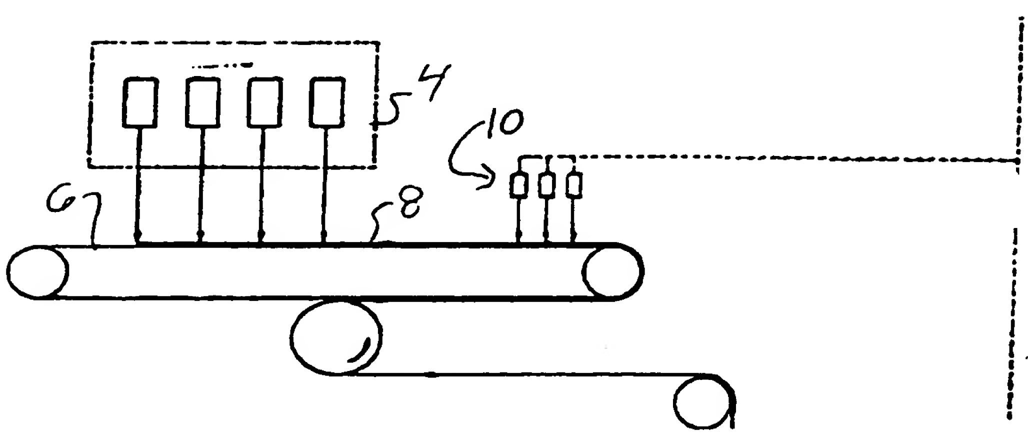


FIG_4

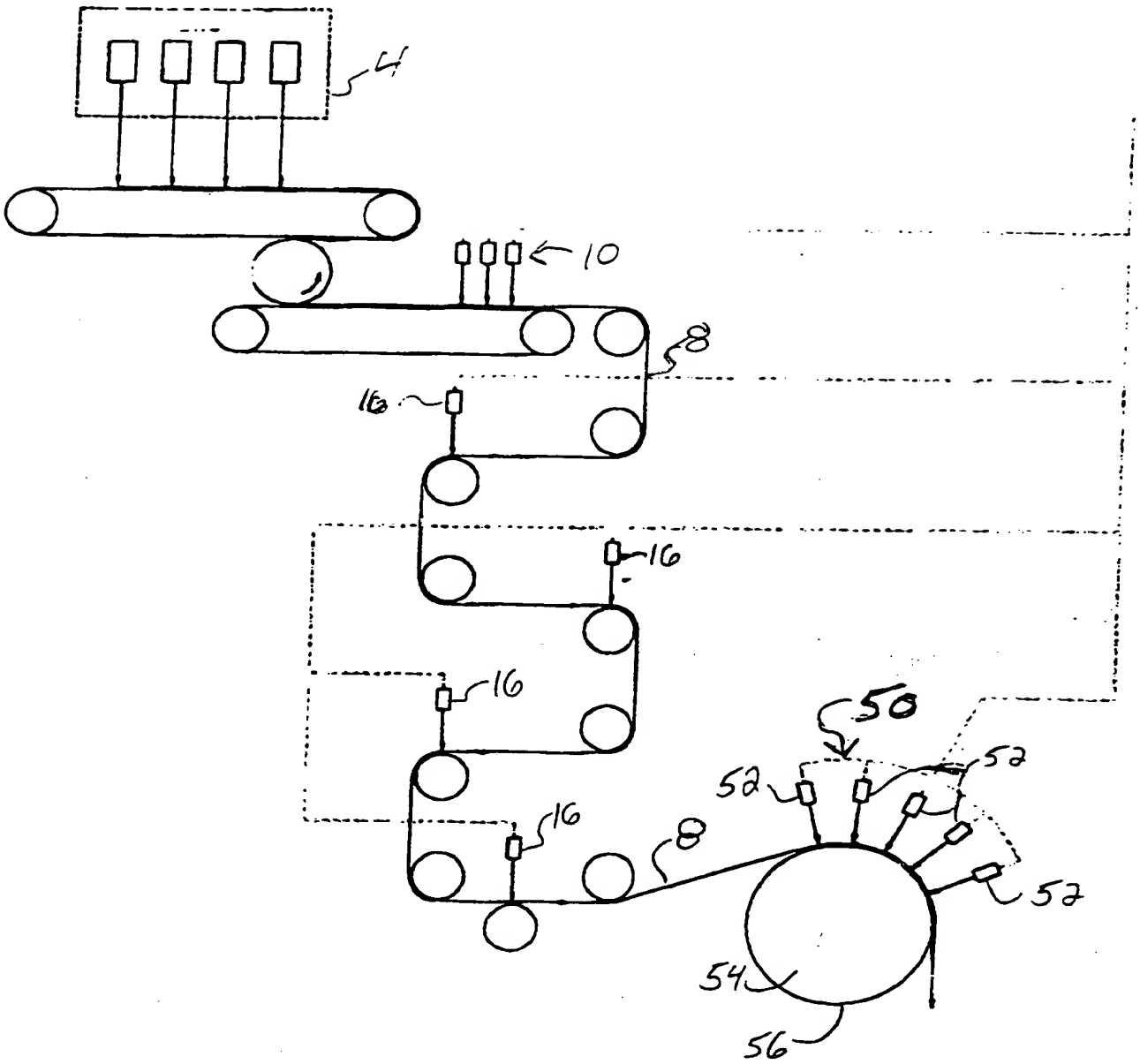


FIG_5A

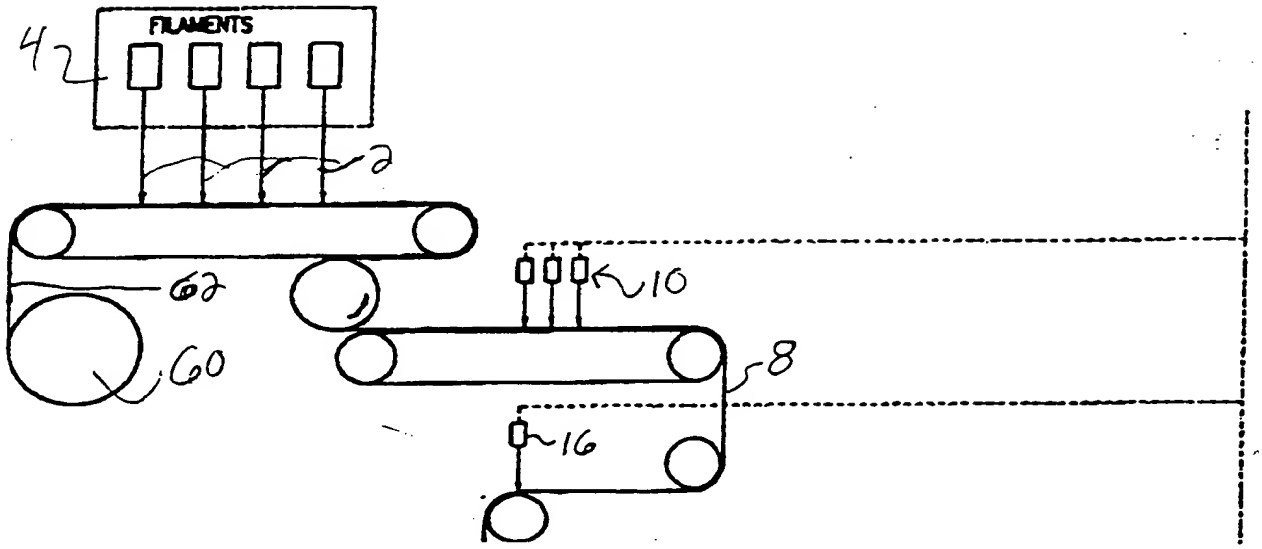
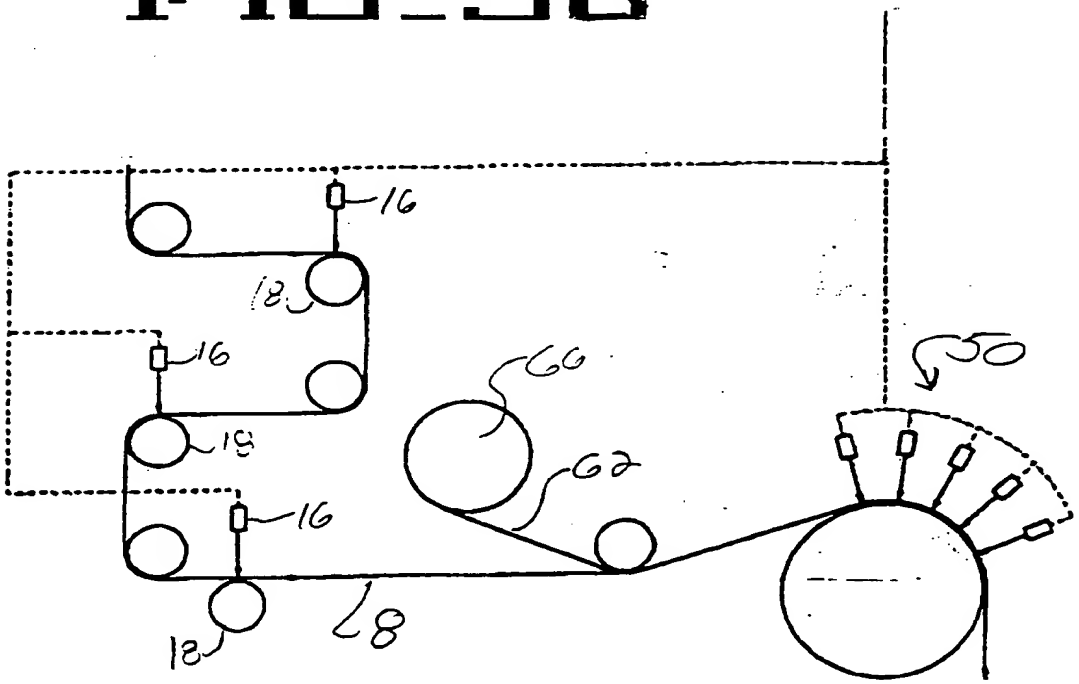


FIG_5B



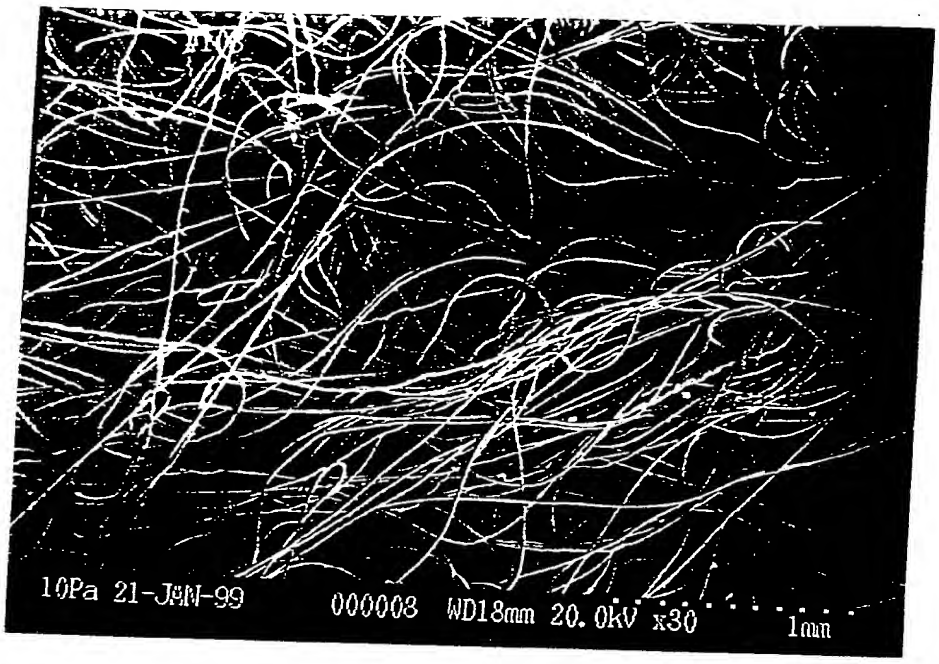


Figure 6

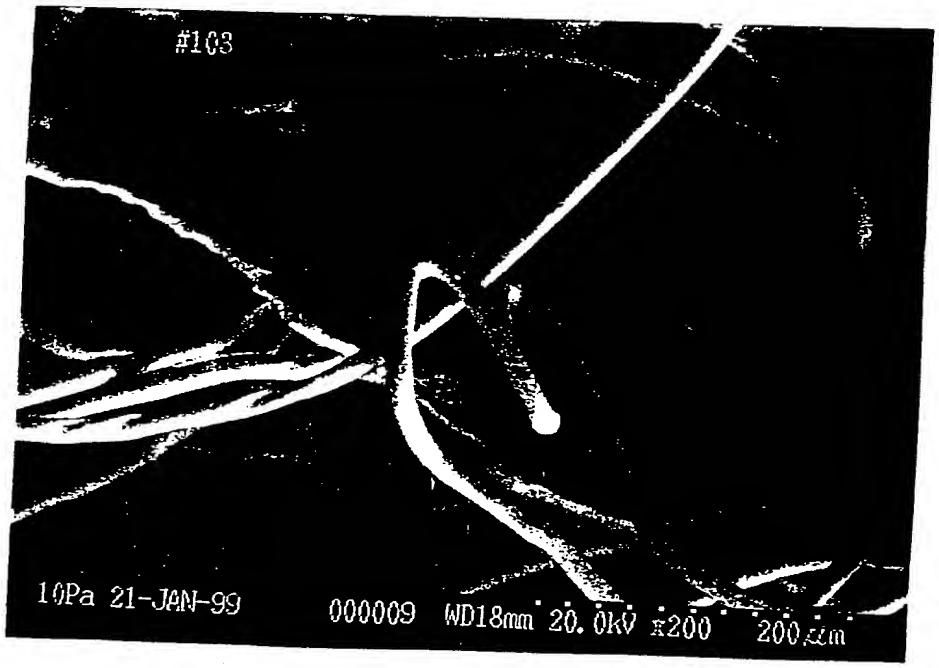


Figure 7

FIG_7A

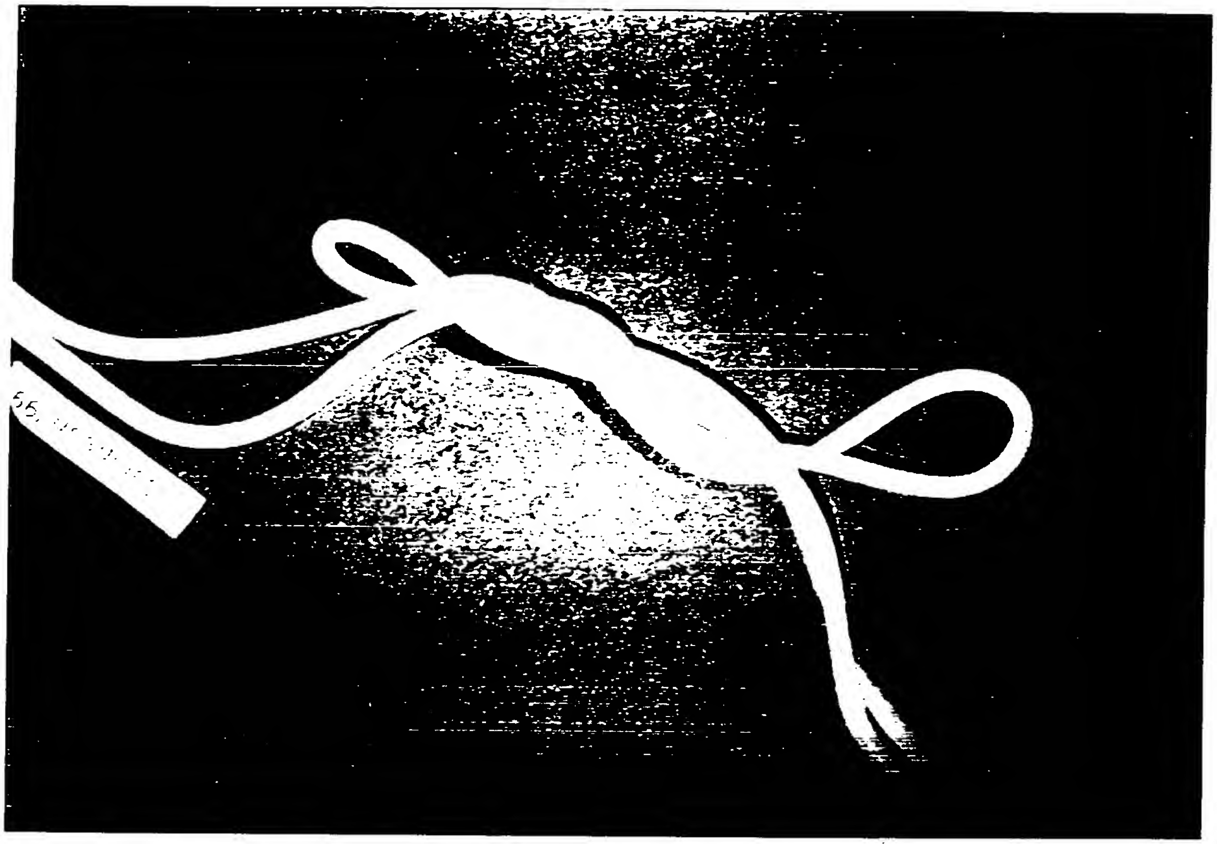
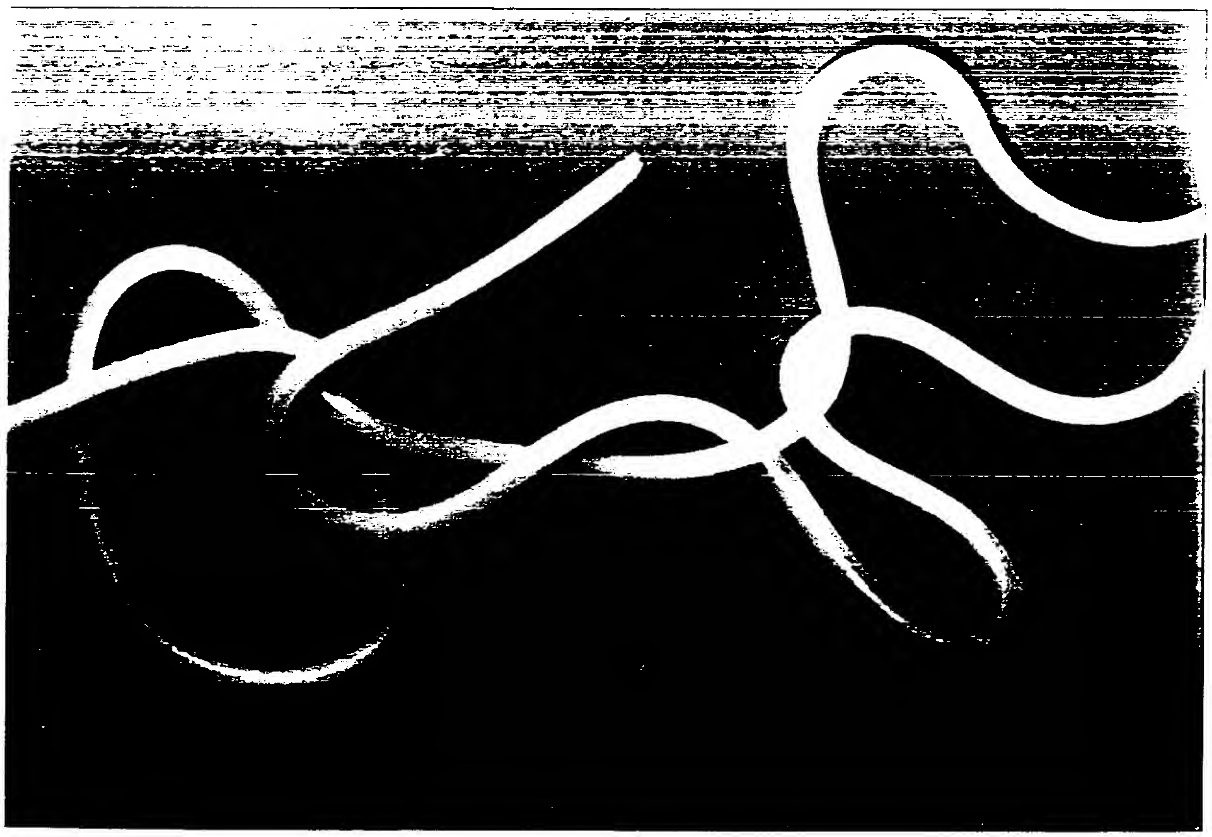


FIG_7B

FIG_7C



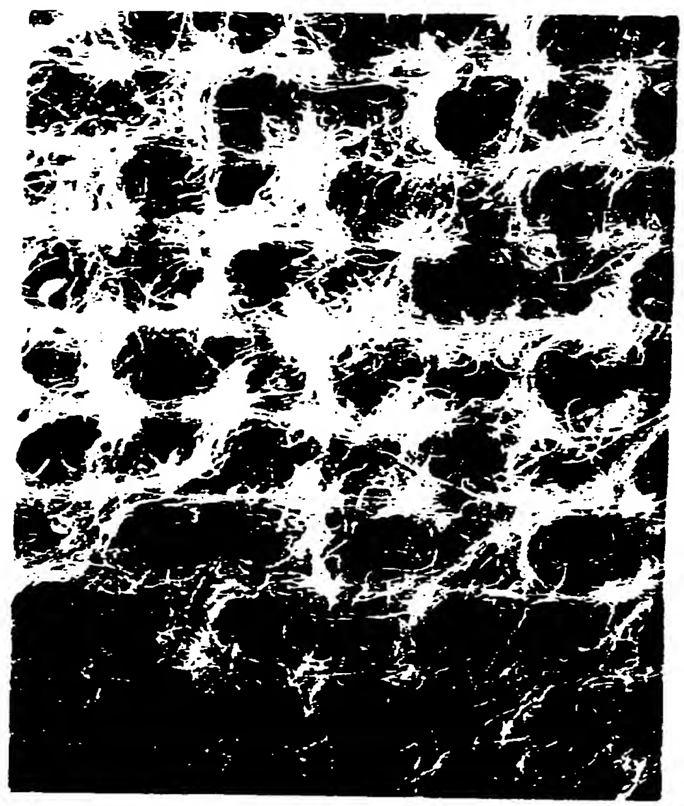


Figure 8: Prior Art

FIG_8A

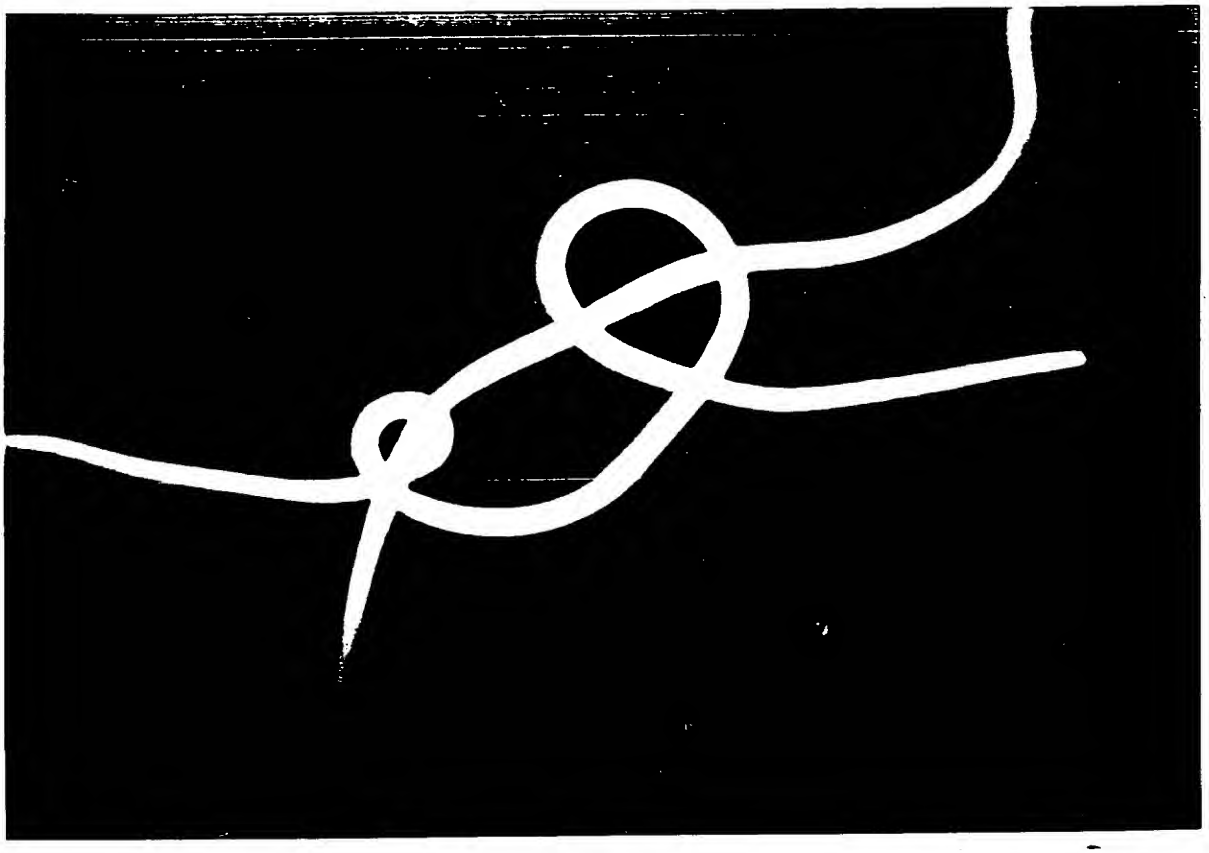


FIG_8B

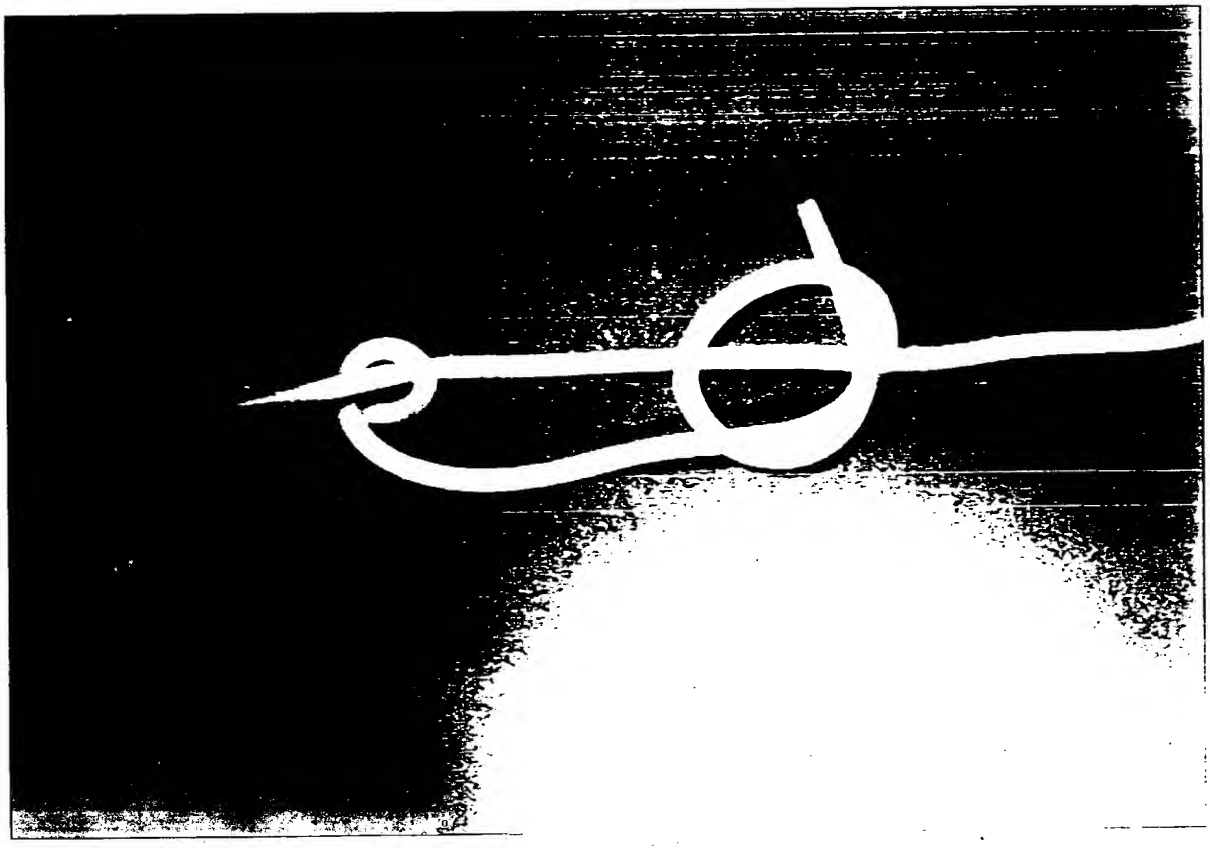


FIG_9

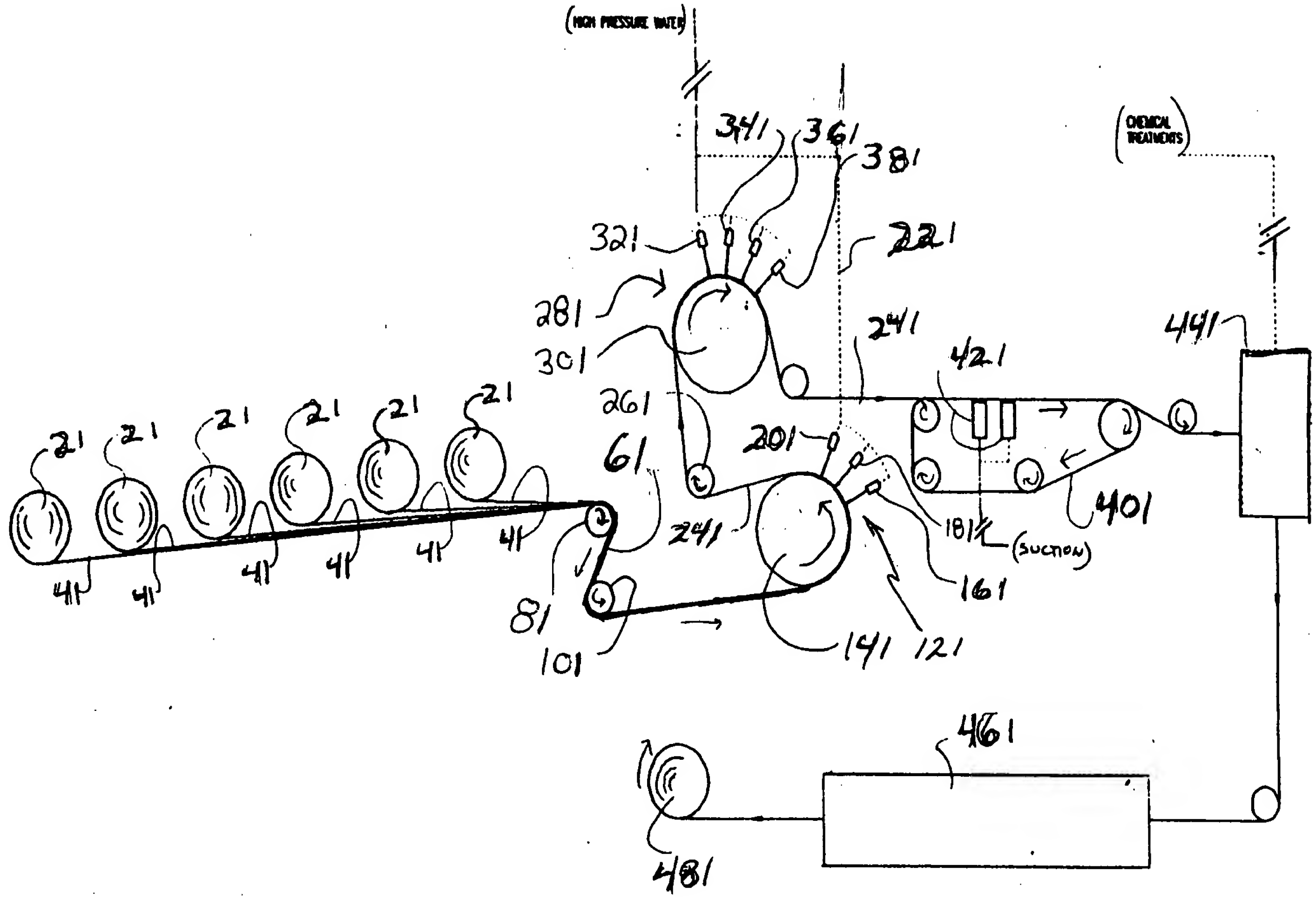
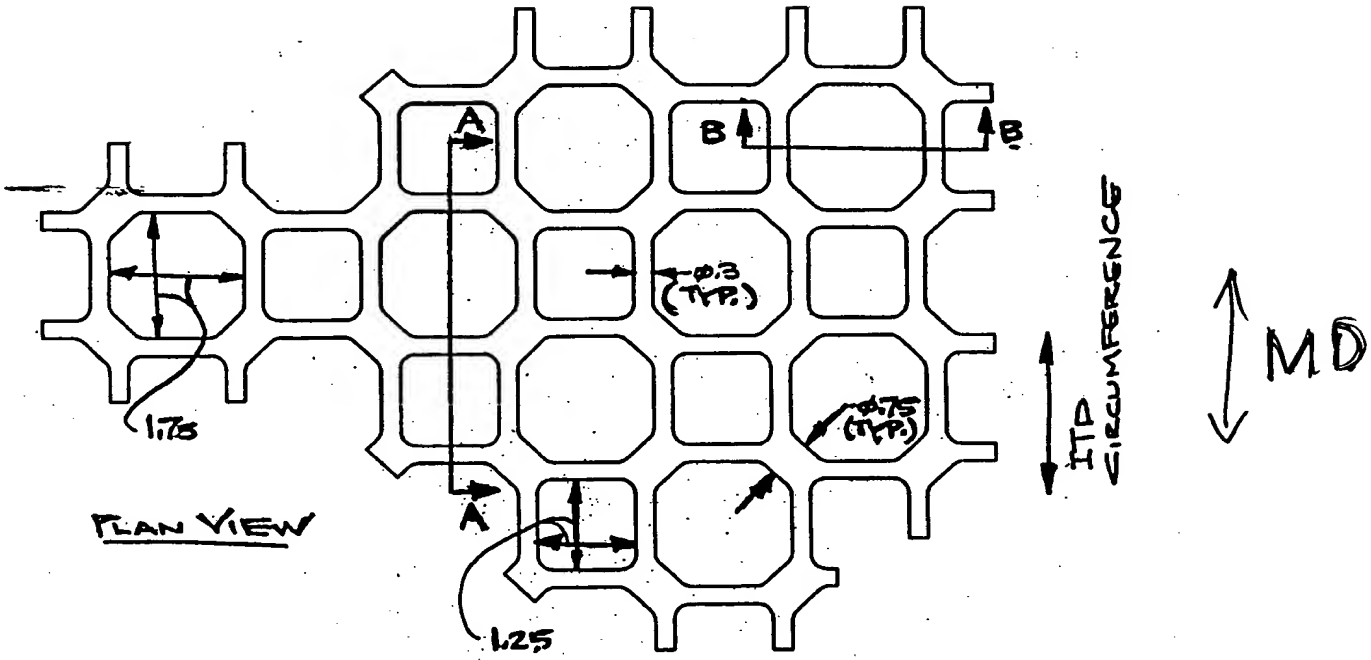


FIG_10



- ALL DIMS. (MM).
- ALL DIMS. APPROX.

FIG_10A

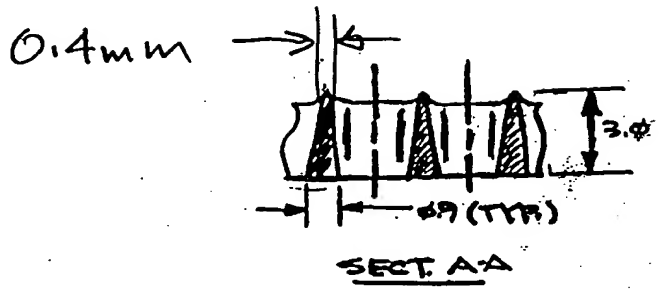


FIG_10B

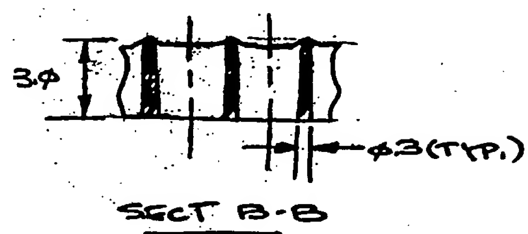


FIG_10C

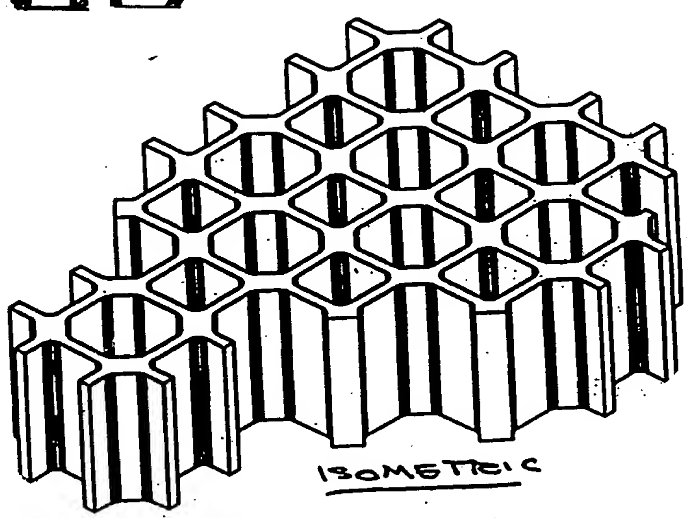


FIG_11A

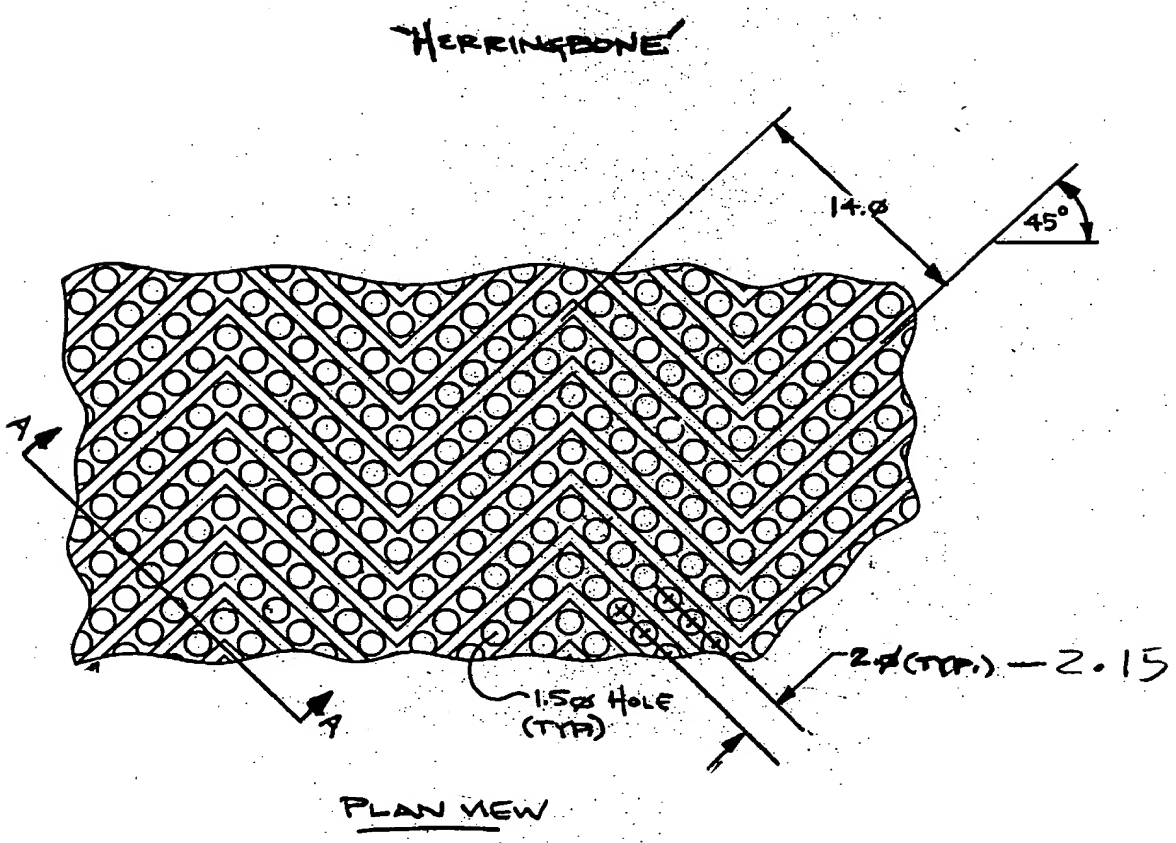
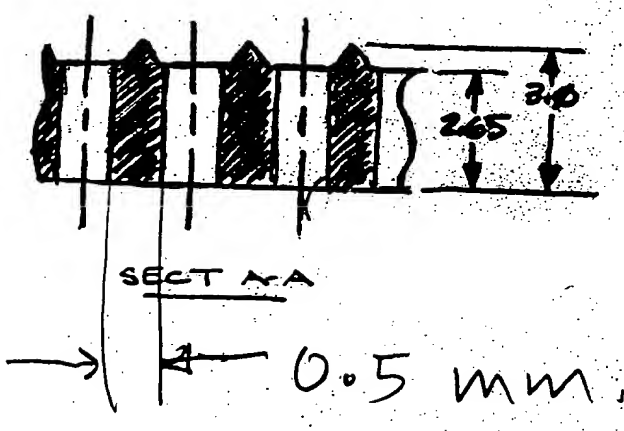


FIG_11B



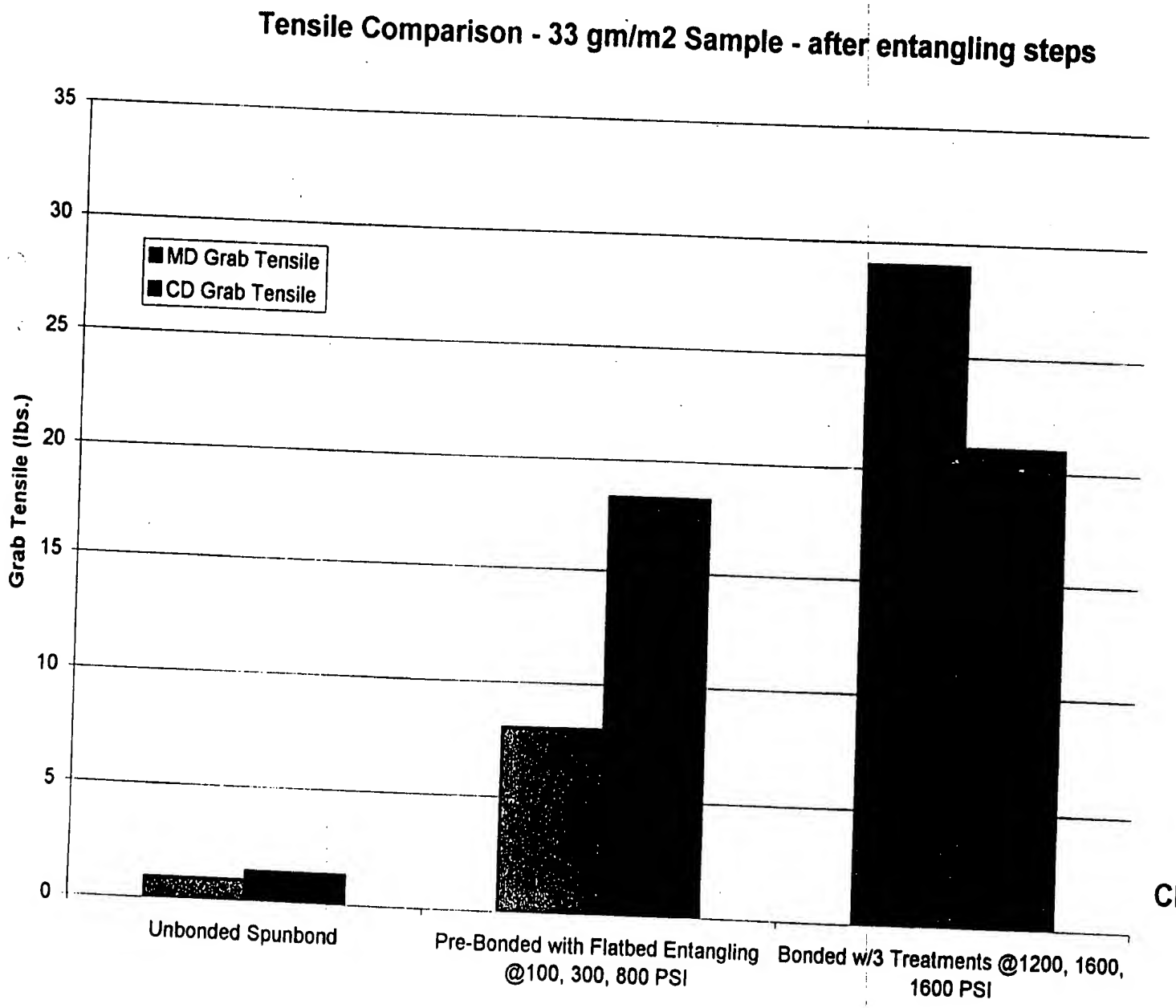


Chart 1

Comparison: 132 gm/m2 Sample Treated Two Times

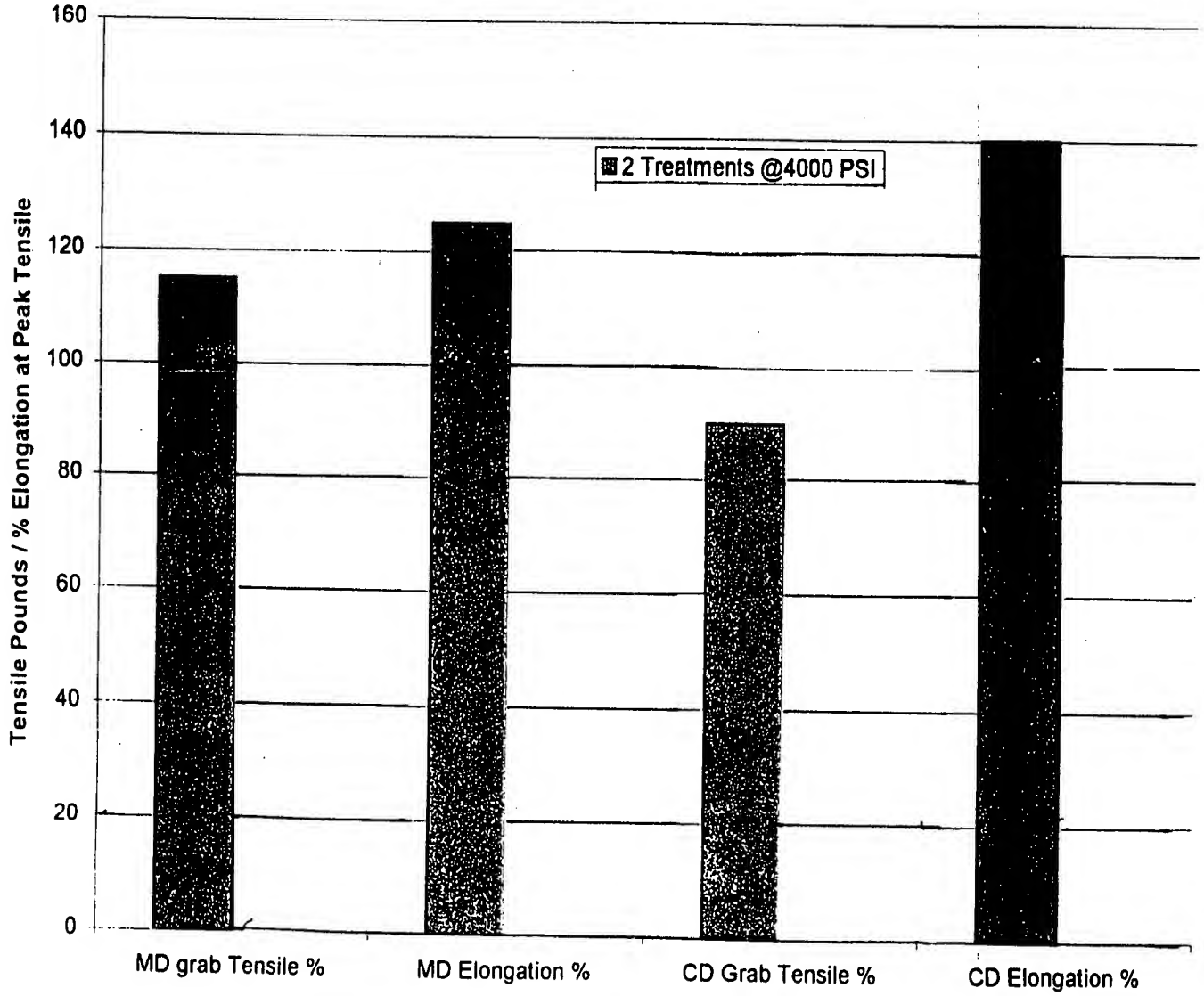


Chart 2

Tensile Comparison: 68 gm/m2 Entangled and Patterned - PP Staple Fiber vs. PP Filament Web

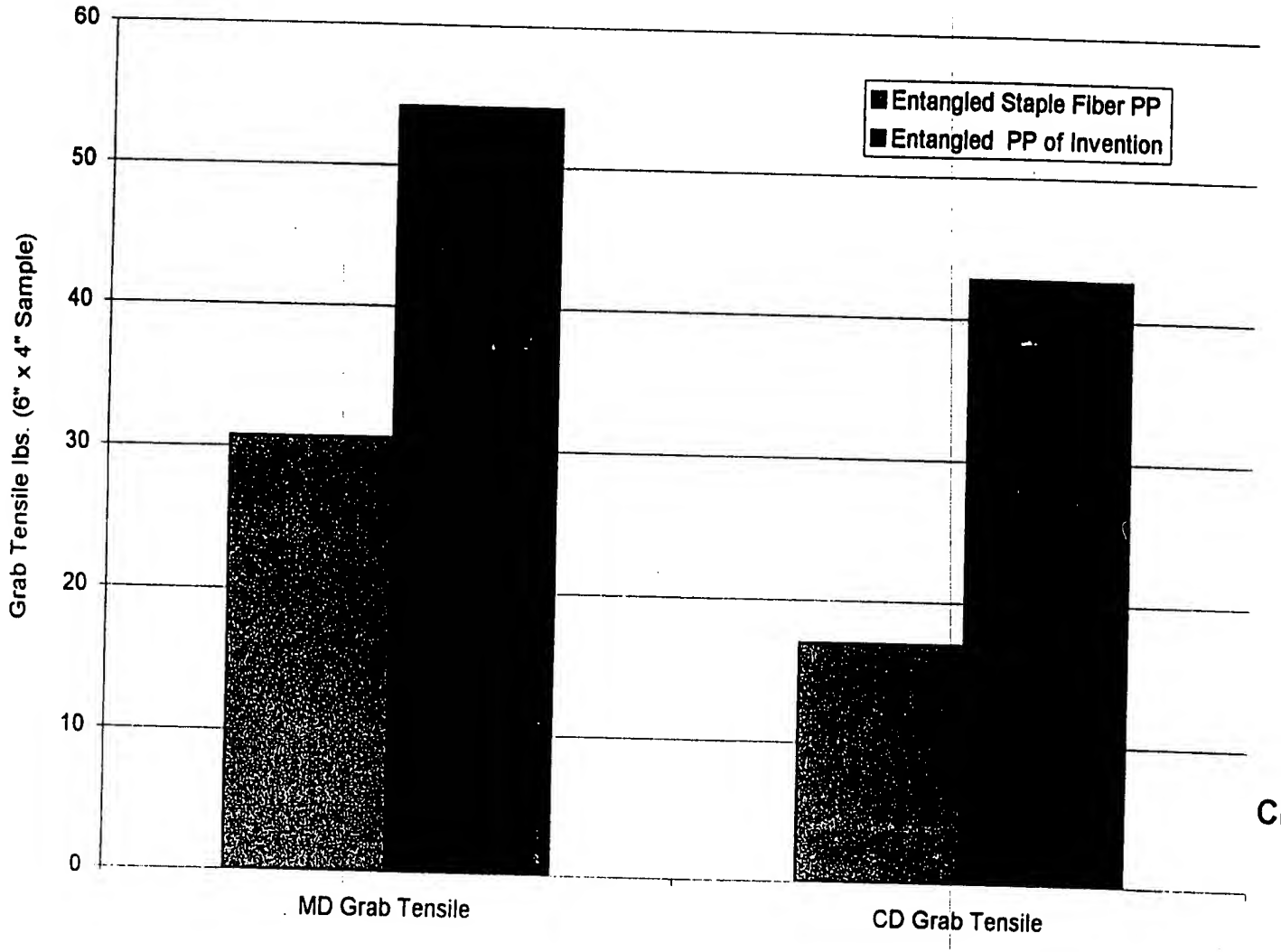


Chart 3

TABLE 1

ID	type	basis weight	denier	water jets process/pattern	jet pressures 1.00	2.00	3.00	4.00	5.00	6.00	total energy HP-hr/lb.	Entanglement completeness	frequency	Fiber interlock	Grab Tensile CD	MD	Trap Tear CD	MD	Abrasion cycles	Strip Tensie, # CD	MD	Elongation CD	MD	Density g/cm^3
W	TBCW	34.00	2.20									1.04	45.43	9.66	10.00	22.00	3.00	9.00	54.00	1.00	5.00	58.00	49.00	0.14
X	TBCW	68.00	2.20									0.98	52.03	19.15	25.00	37.00	7.00	15.00	18.00	4.00	7.00	52.00	51.00	0.45
106	Spinlace	34.00	1.67	flatbed & roll	100	1200	1200	800	1600	1600	1.10	0.85	34.40	46.29	29.00	50.00	16.00	25.00	40.00	4.00	13.00	118.00	117.00	0.06
401A	Spinlace	34.00	1.67	Apex 33x28							1.60	1.17	11.86	45.22						2.90	4.90			0.06
103	Spinlace	68.00	1.67	flatbed & roll	100	1600	1600	1600	1600	1600	0.70	1.18	9.72	40.42	81.00	116.00	34.00	55.00	5.00	6.00	14.00	137.00	120.00	0.17
402A	Spinlace	68.00	1.67	tricot sleeve							1.90	1.10	9.91	41.30						5.80	6.60			0.08
102	Spinlace	68.00	3.00	flatbed & roll	100	1600	1600	1600	1600	1600	0.70	1.18	12.46	21.34						2.10	4.00			0.06
402C	Spinlace	68.00	3.00	tricot sleeve							1.90	1.10	13.38	35.13						2.40	8.20			0.05
302	Spinlace	100.00	3.00	flatbed & roll	100	1600	1700	1700	1700	1700	0.50	1.12	13.91	19.70						4.37	5.80			0.07
Y	SB	34.00	1.67									0.98	103.89	37.33	24.00	47.00	4.00	9.00	38.00	3.00	10.00	39.00	37.00	0.15
Z	SB	68.00	1.67									0.79	28.36	32.46	32.00	51.00	14.00	24.00	10.00	3.00	8.00	33.00	20.00	0.52
201	HET	34.00	2.20	flatbed & roll	100	600	1200	800	1600	1600		0.58	19.07	17.42	10.00	20.00	5.00	11.00	28.00	1.00	5.00	127.00	103.00	0.05
401B	HET	34.00	2.20	Apex 33x28								1.15	15.33	21.09						1.01	2.35			0.06
204	HET	68.00	2.20	flatbed & roll	100	600	1200	1600	1600	1600		0.96	17.45	22.21	42.00	56.00	6.00	16.00	5.00	3.00	8.00	128.00	111.00	0.18
402B	HET	68.00	2.20	tricot sleeve								1.13	19.54	25.93						2.90	3.80			0.06

notes: **TBCW** = thermally point bonded carded webs
Spinlace = water jet entangled continuous filament webs
SB = thermally point bonde spunbond
HET = hydroentangled carded staple fiber webs